VOLUME 17 CONTENTS

Number 1

	1	Editorial
B. AGNEW, A. ANDERSON and T. H. FROST	3	Optimisation of a steady-flow Carnot cycle with external irreversibilities for maximum specific output
J. BELLETTRE, V. SARTRE, F. BIAIS and A. LALLEMAND	17	Transient state study of electric motor heating and phase change solid–liquid cooling
S. B. RIFFAT, C. F. AFONSO, A. C. OLIVEIRA and D. A. REAY	33	Natural refrigerants for refrigeration and air-conditioning systems
F. MEUNIER, F. POYELLE and M. D. LEVAN	43	Second-law analysis of adsorptive refrigeration cycles: the role of thermal coupling entropy production
P. M. PELAGAGGE, A. C. CAPUTO and G. CARDARELLI	57	Optimization criteria of heat recovery from solid beds
K. T. OOI and T. N. WONG	65	A computer simulation of a rotary compressor for household refrigerators
I. W. EAMES and H. M. SABIR	79	Potential benefits of electrohydrodynamic enhancement of two-phase heat transfer in the design of refrigeration systems
XIAO FENG and T. BERNTSSON	93	Critical COP for an economically feasible industrial heat-pump application
LINGEN CHEN, CHIH WU and FENGRUI SUN	103	Heat transfer effect on the specific heating load of heat pumps
	111	Announcement
	I	Calendar
	III	PatentsALERT

Number 2

Y. S. H. NAJJAR	113	Comparison of performance for cogeneration systems using single- or twin-shaft gas turbine engines
C. S. KHALID AHMED, P. GANDHIDASAN and A. A. AL-FARAYEDHI	125	Simulation of a hybrid liquid desiccant based air-conditioning system
K. A. R. ISMAIL and R. F. MIRANDA	135	Two-dimensional axisymmetrical model for a rotating porous wicked heat pipe
G. P. XU and Y. Q. DAI	157	Theoretical analysis and optimization of a double-effect parallel-flow-type absorption chiller

V. TUFANO — 171 Heat recovery in distillation by means of absorption heat pumps and heat transformers

C. TANTOLIN and M. LALLEMAND — 179 Film condensation inside horizontal integral-fin tubes of large diameter

K. A. ANTONOPOULOS, C. TZIVANIDIS and M. VRACHOPOULOS — 193 Using orthogonal expansion of functions over multilayer walls for calculating the layer thermal properties

CHIH WU, LINGEN CHEN and FENGRUI SUN — 203 Optimization of solar absorption refrigerator

209 Announcement

I Calendar

III PatentsALERT

Number 3

D.-W. SUN — 211 Thermodynamic design data and optimum design maps for absorption refrigeration systems

R. AYALA, C. L. HEARD and F. A. HOLLAND — 223 Ammonia/lithium nitrate absorption/compression refrigeration cycle. Part I. Simulation

F. A. YOUSSEF — 235 On the heat transfer from an expanding cylinder in cross-flow

X. FENG and X. X. ZHU — 249 Combining pinch and exergy analysis for process modifications

K. C. NG, H. T. CHUA, W. ONG, S. S. LEE and J. M. GORDON — 263 Diagnostics and optimization of reciprocating chillers: theory and experiment

LINGEN CHEN, FENGRUI SUN and CHIH WU — 277 Influence of heat transfer law on the performance of a Carnot engine

J. J. BONILLA, J. M. BLANCO, L. LÓPEZ and J. M. SALA — 283 Technological recovery potential of waste heat in the industry of the Basque Country

M. PONS and Y. FENG — 289 Characteristic parameters of adsorptive refrigeration cycles with thermal regeneration

C. D. RAKOPOULOS and E. G. GIAKOUMIS — 299 Speed and load effects on the availability balances and irreversibilities production in a multi-cylinder turbocharged diesel engine

315 Announcements

I Calendar

III PatentsALERT

Number 4

W. RIVERA, R. BEST, J. N. BAKER, W. H. FLETCHER, C. L. HEARD and F. A. HOLLAND	317	Mobile pilot-plant for the production of environmentally clean steam
Y. TENG, R. Z. WANG and J. Y. WU	327	Study of the fundamentals of adsorption systems
W. QIN and C. Y. LIU	339	Liquid flow in the anisotropic wick structure of a flat plate heat pipe under block-heating condition
K. A. ANTONOPOULOS, M. VRACHOPOULOS and C. TZIVANIDIS	351	Experimental and theoretical studies of space cooling using ceiling-embedded piping
R. M. LAZZARIN and A. GASPARELLA	369	New ideas for energy utilisation in combined heat and power with cooling: I. Principles
P. K. NAG and S. DE	385	Design and operation of a heat recovery steam generator with minimum irreversibility
L. SHAO and S. B. RIFFAT	393	Flow loss caused by heat pipes in natural ventilation stacks
LINGEN CHEN, FENGRUI SUN, CHIH WU and R. L. KIANG	401	A generalized model of a real refrigerator and its performance
	I	Calendar
	III	PatentsALERT

Number 5

K. C. NG, H. T. CHUA and Q. HAN	413	On the modeling of absorption chillers with external and internal irreversibilities
A. ONG'IRO, V. I. UGURSAL, A. M. AL TAWEEL and J. D. WALKER	427	Modeling of heat recovery steam generator performance
L. SCHIBUOLA	447	High-efficiency recovery for air-conditioning applications in a mild climate: a case study
H. Z. ABOU-ZIYAN, M. F. AHMED, M. N. METWALLY and H. M. ABD EL-HAMEED	455	Solar-assisted R22 and R134a heat pump systems for low-temperature applications
M. MOSTAFAVI and B. AGNEW	471	Thermodynamic analysis of combined diesel engine and absorption refrigeration unit—naturally aspirated diesel engine
R. M. LAZZARIN and A. GASPARELLA	479	New ideas for energy utilisation in combined heat and power with cooling: II. Applications

I Calendar

III PatentsALERT

Number 6

P. NEVEU and J. CASTAING-LASVIGNOTTES — 501 Development of a numerical sizing tool for a solid–gas thermochemical transformer—I. Impact of the microscopic process on the dynamic behaviour of a solid–gas reactor

J. CASTAING-LASVIGNOTTES and P. NEVEU — 519 Development of a numerical sizing tool applied to a solid–gas thermochemical transformer—II. Influence of external couplings on the dynamic behaviour of a solid–gas thermochemical transformer

F. N. ALASFOUR — 537 Butanol—a single-cylinder engine study: availability analysis

K. J. KIM, K. T. FELDMAN JR, G. LLOYD and A. RAZANI — 551 Compressor-driven metal-hydride heat pumps

XIAO PING WU, P. JOHNSON and A. AKBARZADEH — 561 Application of heat pipe heat exchangers to humidity control in air-conditioning systems

N. MILOSAVLJEVIC, P. MALINEN, P. HEIKKILÄ, I. JOKIOINEN and K. EDELMANN — 569 Experimental and theoretical investigations for the design of scrubbers in heat recovery from paper machines

ZHEN-XIANG GONG and A. S. MUJUMDAR — 583 Finite-element analysis of cyclic heat transfer in a shell-and-tube latent heat energy storage exchanger

M. MOSTAFAVI and B. AGNEW — 593 Thermodynamic analysis of combined diesel engine and absorption refrigeration unit—naturally aspirated engine with pre-cooling

601 Erratum

I Calendar

III PatentsALERT

Number 7

K. DARKWA and P. W. O'CALLAGHAN — 603 Green transport technology (GTT): analytical studies of a thermochemical store for minimising energy consumption and air pollution from automobile engines

M. PONS — 615 Analysis of the adsorption cycles with thermal regeneration based on the entropic mean temperatures

LINGEN CHEN, FENGRUI SUN, CHIH WU and JIANZHENG GONG — 629 Maximum power of a combined-cycle isothermal chemical engine

LINGEN CHEN, CHIH WU and FENGRUI SUN — 639 Steady flow combined refrigeration cycle performance with heat leak

CHI-CHUAN WANG — 647 A numerical method for thermally non-equilibrium condensing flow in a double-pipe condenser

R. BUDIN and A. MIHELIĆ-BOGDANIĆ — 661 Heat recovery in polyester production: a case study

LANCHAO LIN and A. FAGHRI — 667 Steady-state performance in a thermo-syphon with tube separator

681 Announcements

I Calendar

III PatentsALERT

Numbers 8–10

Special Issue: Energy Efficiency in Industry

P. A. PILAVACHI — 683 Editorial

Heat Exchangers

M. GROLL and R. MERTZ — 685 Improved evaporation heat transfer surfaces for cost-effective compact heat exchangers for the process industries

P. A. KEW and K. CORNWELL — 705 Correlations for the prediction of boiling heat transfer in small-diameter channels

J. M. GRILLOT — 717 Compact heat exchangers liquid-side fouling

A. J. KARABELAS, S. G. YIANTSIOS, B. THONON and J. M. GRILLOT — 727 Liquid-side fouling of heat exchangers. An integrated R&D approach for conventional and novel designs

G. BERGELES, D. BOURIS, M. YIANNESKIS, S. BALABANI, A. KRAVARITIS and S. ITSKOS — 739 Effects of fouling on the efficiency of heat exchangers in lignite utility boilers

J. D. ISDALE, P. MERCIER, J. M. GRILLOT, A. MULHOLLAND and J. GOMATAM — 751 Integrated modelling of process heat transfer with combustion and fouling

J. D. ISDALE, A. M. JENKINS, V. SEMIÃO, M. G. CARVALHO and M. C. WELBOURNE — 763 Fouling of combustion chambers and high-temperature filters

P. BANDELIER — 777 Improvement of multifunctional heat exchangers applied in industrial processes

C. LUZZATTO, A. MORGANA, S. CHAUDOURNE, T. O'DOHERTY and G. SORBIE	789	A new concept composite heat exchanger to be applied in high-temperature industrial processes
J. C. DERONZIER and G. BERTOLINI	799	Plate heat exchangers in liquid-crystal polymers
C. H. PHILLIPS, G. LAUSCHKE and H. PEERHOSSAINI	809	Intensification of batch chemical processes by using integrated chemical reactor–heat exchangers
A. MULDER, O. BROST and P. NEUMANN	825	Catalytic combustion in a sintered metal reactor with integrated heat exchanger

Chemical Reactors

N. V. DEWACHTERE, G. F. FROMENT, I. VASALOS, N. MARKATOS and N. SKANDALIS	837	Advanced modeling of riser-type catalytic cracking reactors
L. FALK and J. VILLERMAUX	845	Numerical scale-up and design of high-efficiency mixers for control and optimisation of the yield and selectivity in chemical reactors
R. J. JACHUCK, J. LEE, D. KOLOKOTSA, C. RAMSHAW, P. VALACHIS and S. YANNIOTIS	861	Process intensification for energy saving

Separation Processes

P. D. MARTIN and S. W. SWANTON	869	Improved efficiency of adsorption processes
D. VERDOES, G. J. ARKENBOUT, O. S. L. BRUINSMA, P. G. KOUTSOUKOS and J. ULRICH	879	Improved procedures for separating crystals from the melt
R. GANI, G. HYTOFT and C. JAKSLAND	889	Design and analysis of supercritical extraction processes
C. BERMOND	901	Establishing the scientific base for energy efficiency in emerging pressing and drying technologies
A. VAN DER DRIFT, N. B. K. RASMUSSEN and K. JØRGENSEN	911	Improved efficiency drying using selective emittance radiant burners

Furnaces, Kilns and Ovens

M. G. CARVALHO and M. NOGUEIRA	921	Improvement of energy efficiency in glass-melting furnaces, cement kilns and baking ovens
A. KONTOPOULOS, K. KRALLIS, E. KOUKOURAKIS, N. DENAXAS, N. KOSTIS, A. BROUSSAUD and O. GUYOT	935	A hybrid, knowledge-based system as a process control 'tool' for improved energy efficiency in alumina calcining furnaces

Electricity Saving

H. GROSSMANN and L. SALMÉN 947 Exploration of new scientific ideas for significant electricity savings in mechanical upgrading of pulp fibres for papermaking

Refrigeration

N. J. HEWITT and J. T. MCMULLAN 955 The replacement of CFCs in refrigeration equipment by environmentally benign alternatives

Systems Engineering

C. JAKSLAND, G. HYTOFT and R. GANI 973 Computer-aided process design and optimization with novel separation units

F. MARÉCHAL and B. KALITVENTZEFF 981 Effect modelling and optimization, a new methodology for combined energy and environment synthesis of industrial processes

J. KLEMEŠ, V. R. DHOLE, K. RAISSI, S. J. PERRY and L. PUIGJANER 993 Targeting and design methodology for reduction of fuel, power and CO_2 on total sites

G. HEYEN and B. KALITVENTZEFF 1005 Methodology for optimization of operation to reduce site-scale energy use in production plants

L. PUIGJANER 1015 Process integration with combined heat and power (CHP)

H. C. VAN DEVENTER 1035 Feasibility of energy efficient steam drying of paper and textile including process integration

1043 Announcement

I Calendar

III PatentsALERT

Number 11

P. M. PELAGAGGE, A. C. CAPUTO and G. CARDARELLI 1045 Comparing heat recovery schemes in solid bed cooling

Y.-P. CHANG, R. TSAI and J.-W. HWANG 1055 Condensing heat transfer characteristics of aluminum flat tube

Z.-X. GONG and A. S. MUJUMDAR 1067 Thermodynamic optimization of the thermal process in energy storage using multiple phase change materials

T. KIATSIRIROAT and T. EUAKIT 1085 Performance analyses of an automobile air-conditioning system with R22/R124/R152A refrigerant

Z. ZHOU — 1099 Thermal analysis of slow discharge from a pressurized natural gas storage tank

R. BEST, W. RIVERA, M. J. CARDOSO, R. J. ROMERO and F. A. HOLLAND — 1111 Modelling of single-stage and advanced absorption heat transformers operating with the water/Carrol mixture

1123 Announcement

1125 Erratum

I Calendar

Number 12

LI ZHI ZHANG and LING WANG — 1127 Performance estimation of an adsorption cooling system for automobile waste heat recovery

M. KADJA and G. BERGELES — 1141 Computational study of turbine blade cooling by slot-injection of a gas

N. E. WIJEYSUNDERA — 1151 Performance of three-heat-reservoir absorption cycles with external and internal irreversibilities

M. R. CONDE — 1163 Energy conservation with tumbler drying in laundries

N. M. AL-NAJEM and M. M. EL-REFAEE — 1173 A numerical study for the prediction of turbulent mixing factor in thermal storage tanks

S. GARIMELLA, D. LACY and R. E. STOUT — 1183 Space-conditioning using triple-effect absorption heat pumps

1199 Announcement

I Calendar

III PatentsALERT